Young Children's Tablet Computer Play

Thomas Enemark Lundtofte

The author reviews the research and scholarly literature about young children's play with tablet computers and identifies four major topics relevant to the subject—digital literacy, learning, transgressive and creative play, and parental involvement. He finds that young children's tablet computer play relies not only on technology, but also on sociocultural conditions. He argues that research should pay greater attention to transgressive play and should in general treat play as an autotelic concept because the nuances of play are as important as its function. He calls attention to the lack of affordances for creativity in apps for young children, explores the need for parental involvement in young children's tablet computer play, and discusses the importance of agency and access in such play. **Key words**: digital media; iPad; tablet computer; play and young children

Introduction

I aim to make clear what we know about young children's play with tablet computers by considering research from the human sciences that mentions play, young children, and tablet computers (or similar terms). This leads me to a number of questions, some of which have also been treated in the research—questions about the kind of play possible with a tablet computer and about what we even mean by "tablet computer play." To provide a framework for these questions, I discuss play theory as well as theories on technological affordances and how this aspect of children's play with technology corresponds with what we know about the nature of play in general.

Defining play is famously difficult and, as Brian Sutton-Smith (1997) argued, definitions usually turn out ambiguous at best. My theoretical perspective relies on a cultural understanding of play, which, in the words of the Danish

American Journal of Play, Volume 12, Number 2 © The Strong
Contact Thomas Enemark Lundtofte at thomas@sdu.dk

play theoretician Flemming Mouritsen (1996), does not reject formal learning as part of the play discourse, but views it as a side effect of play. After all, it could be argued, in reference to John Dewey (1971), that children are always learning—as are adults. Mouritsen argues that children's culture is play culture, based on what has been termed the "autotelic" nature of play, which, Miguel Sicart (2014) defines as "an activity with its own goals and purposes" (14). Following this perspective brings the emic (from within the social group, eds.) nuances of young children's play culture to light, because the meaningful is defined by those who play.

I start with some reflections on the concept of digital play as well as tablet computers and their affordances for play by young children. Then I present the methodological considerations behind my thinking before I move on to the four perspectives I identify in the literature I review. Finally, I offer some reflections about how we may approach the field of young children's tablet computer play in future research.

Tablet Use or Tablet Play?

Before I discuss the themes in the literature, we should first explore whether—and how—we can talk about young children's tablet computer use as digital play. To approach this question, we must visit the field of play theory to understand the ideological frameworks of the different types of research we are considering. I also need to offer some remarks about studying tablet computers in this context. As objects of play, tablets take on many different forms due to their richness in affordances as computers and mobile devices. I present the approaches taken in the research that deals with this particular technology, and thus offers a broad, many-facetted image of how young children (and some adults) view tablets as toys. Even though these discussions do not exhaust the topic, they do provide a telling take on how different stakeholders in young children's play culture view tablet computers.

First, tablet computers are objects of access to digital information and cultural participation, leading to so-called "digital literacy." Second, tablets are also tools for the development of young children's skills (e.g. performing gestures and understanding symbols) in handling computers, including collaborations that use them to solve problems. Third, as the research has shown, tablet computers constitute playthings or toys in themselves, and children use them as such, which

hardware and app designers are quite aware of and allow to guide their intentions to varying degrees. And fourth, young children are given access to tablet computers by their parents, leading to further variances in perception of what the devices are and should be, depending on different views about parenting. These four points all consider tablet computers as objects in young children's lives, but they produce different pieces to a puzzle showing what tablets are and how they affect and contribute to play culture. I first review the research generated at the intersections between these notions in play culture.

As background, consider that, whereas Brian Sutton-Smith (1997) speaks of play rhetorics, Mihai I. Spariosu (1989) has argued that play theories usually present some sort of ideology. The Norwegian play scholar Maria Øksnes (2012) has outlined a historical ideological development in functionalist views about play theory since the early twentieth century. She argues that functional ideologies have focused on gross motor skills (pre–World War I), fine motor skills (post–World War I), cognition (post–World War II), emotions, and morals (1970s), and creativity, empathy, and autonomy (1990s). But there is at least one important aspect of play missing from these functional ideologies—the frivolous play described by Sutton-Smith (1997). Frequently, a naughty, transgressive, and messy play that often seems inaccessible to adults, frivolous play also gets dismissed within functional play ideologies as simply static or noise.

Of course, play theory predates tablet computers, but—if we think of children's culture as play culture, as Mouritsen (1996) did—kids' practices with tablet computers would surely appear motivated by play. Early-childhood researcher Marilyn Fleer claims, in reference to Mariane Hedegaard (2002) and Lev Vygotsky (1978), that young children subscribe to a "leading activity," which is determined by their social context as well as by their age. Young children move from play as their dominant leading activity toward learning as they start school. Fleer (2014) follows Hedegaard (2002) in holding that children's motives are related to what is meaningful and important to them and argues that if they subscribe to play as a leading activity, their motives will be aligned with the play. Consequently, young children who have hardly begun their formal education will likely consider play their main activity. This does not mean that they play all the time, nor does it mean that they do not learn. It does mean, however, that their abilities and activities in using a tablet computer will likely be motivated by play.

Jackie Marsh and her associates offered a new classification of digital play subsequent to their study of how apps promote play and creativity with young children (Marsh et al. 2015). Their taxonomy for play, building on Bob Hughes

(2002), consists of a number of play types with descriptions of their adaptation to digital play. Furthermore, Marsh and her colleagues added a category of "transgressive play" to the framework, defining it as: "play in which children contest, resist, and/or transgress expected norms, rules and perceived restrictions in both digital and nondigital contexts" (Marsh 2016, 9). Their study may well be the most important work so far about young children's tablet computer play because it seeks to outline the very nature of digital play and explain how it gets validated and grows more nuanced.

In line with earlier research about digital play, Marsh and her coauthors reject the supposed differences between digital play and traditional play. Christine Stephen and Lydia Plowman (2014) also touch on this point in the study of children's play with digital technologies and toys in *The SAGE Handbook of Play and Learning in Early Childhood*. They argue that digital technologies can support creative play and expression and that parental and educational anxieties about screen time are often based on misunderstandings of the kinds of play different technologies afford (2014).

Discussions about the affordances offered by digital play has attracted attention in the current research. Psychologist James J. Gibson (1986) originally coined the term to explain what a particular environment offers a particular animal given that animal's abilities. The term has since been appropriated by other social sciences, including media and communication studies, which often take it to mean the ways in which a message or text is likely to be received by its audience (Norman 1988). Adrienne Shaw (2017) has revisited the term recently along with the communications paradigm of encoding and decoding offered by Stuart Hall (2007). Shaw argues that the three categories of decoding offered by Hall can be used to categorize affordance typologies as either dominant and hegemonic (in which the intentions of designers align with those of the users); negotiated (which falls between "perceptible" and "hidden" affordances); or oppositional (in which users seek to take advantage of "hidden" or "false" affordances). The concepts of perceptible, hidden, and false affordances refer to instances when "objects do what it looks like they should be able to do" or when their "uses . . . are not apparent," or when "those uses objects look like they should be able to do but do not" (593–94). A tablet computer affords a range of things depending on which app, if any, is in use. As we shall see, apps for young children have been criticized for lacking affordances or for hiding them—in the sense that poor design sometimes renders the apps too difficult to decode. However, tablet computers must afford some attraction to young children, since the popularity of the devices

is unquestioned. By looking to play practices, we stand to gain knowledge about what sort of affordances children make use of and how they use them.

The Literacy and Access Perspective

Media and education scholars Kirsten Drotner and Ola Erstad (2014) have identified two dominant discourses about the concept of literacy in relation to the role of media and digital technologies in society. One concerns the functional aspects of learning, that is using digital technologies to achieve good results. The second involves a critical discussion about teaching children to reflect on media and digital technologies. Sonia Livingstone (2002), another strong voice in the literacy debate, argues that children should employ a critical approach to media, which makes media literacy key. From the literacy discussions about young children's play with tablet computers, we gain insights concerning how young children, reflecting on their digital play, realize and expand their perception of the affordances tablet computers hold for such play.

A range of European reports investigate the use children younger than nine have made of technologies and the internet since tablet computers became popular. Holloway, Green, and Livingstone (2013) argue "it is more likely that 'what' young children do on their touchscreen is of greater significance than general screen usage" (20). Subsequent reports by Chaudron (2015), Johansen, Larson, and Ernst (2016) and Marsh and her associates (2015) concur on this point and also argue that children learn to use tablet computers from their immediate environment. The report by Marsh and her colleagues, geared toward the children's media industry, makes some interesting observations about designing affordances in apps that promote play and creativity. The advice generally emphasizes designing for developmentally appropriate levels of simplicity, showing instead of telling, and avoiding pop-ups and commercials.

Henry Jenkins (2009) suggests eleven basic categories of skills that we should look for when assessing new media literacy. The first of these is play, because—so he argues—individuals should be able to experiment with their environment to solve problems. Drawing on the digital literacy concept of David Buckingham (2015) and Allan Martin (2008), Isabel Fróes (2015) defines a "playful literacy" based on a study about the play of young Danish children with computer tablets in a preschool environment. She argues that this playful literacy should describe how children "use, interact, relate, communicate, create, have

fun with, and challenge digital tools through playful behaviour" (48). Karen Wohlwend (2015) offers a similar argument based on her study of collaborative literacy among young children playing with puppetry apps. Wohlwend finds also that young children easily learn important digital literacy practices, such as collaborative composing, when they play together with tablets.

Claudia Lampert (2016) and Laura Teichert and Ann Anderson (2014) have explored the sociocultural aspects of tablet computer play and how children obtain proficiency in handling the devices at home in studies about literacy. Although most literacy research gathers qualitative empirical data in institutional settings, these two studies explore children's home environments. Both studies assert that parents hold a significant role in socializing young children into appropriate tablet computer use. Lampert's (2016) study of Germans aged two to six years old and their parents further reveals that children mainly use tablet computers off line and that their online activities increased among five-year-olds and older. Marsh (2016)—drawing on a United Kingdom survey of two thousand parents of young children aged five and under and on observations of six children in their homes—concludes that the critical understanding of traditional texts develops in children later, but their reception, design, and production of electronic media texts develops early. Finally, in a study about the impact of touchscreens on the literacy levels (in the traditional sense of the term) of Australian preschoolers, Michelle Neumann (2014) concludes that greater access to touchscreens correlates, according to parents' perceptions, with higher literacy levels.

The digital literacy discussion has become prolific. Consequently, what I say here about young children's tablet computer play may seem reductionist to some. However, we can clearly determine through these studies how children's digital media literacies are informed by and developed in social contexts. We can also determine that parents and teachers play important roles in developing young children's critical dissemination of digital media and also stress the importance of adult interest in young children's tablet computer play. Furthermore, formal learning, as the proverbial side effect of playing, becomes evident when children are provided access and guidance in tablet computer play.

The Learning Perspectives: Skills and Sociocultural Dimensions

Covering some of the same ground as digital literacy studies, I consider here how

young children learn to use tablet computers and what they learn from using them. Such questions have framed research about human-computer interaction as well as more general sociocultural research. And this research illustrates the skills children need to play with tablet computers and how they obtain them. It also reveals some of what children find meaningful in tablet computer play, although it is too often limited to adult perspectives on learning.

To assess young children's understanding of tablet computers as technological devices, Aziz and his associates (2014), Vicente Nacher and his colleagues (2015), and Vatau, Cramaric, and Schipor (2015) all investigated the operative skill sets of young children. These studies use of so-called "gamification" in play-oriented designs to render them more interesting to young children. Aziz and his associates find young children able to perform seven basic gestures— tap, drag and slide, free rotate, drag and drop, pinch, spread, and flick—by the age of four. Vatavu, Cramaric, and Schipor correlate children's individual capabilities in handling tablet computer gestures to their visuospatial abilities and suggest that adults' skills in handling tablet computers supersede young children's in any case. Nacher and his colleagues propose a different research question, exploring how apps afford certain gestures to young children aged two to three years. They conclude from their observations of thirty-two children that most apps afford only tap and slide gestures and that one-finger rotation, two-finger scale up and scale down may be effectively incorporated into apps with comparatively little effort.

The above skill set assessment studies offer interesting pragmatic results, but they do not explain how young children obtain the skills in question through play. Also, the evaluations point only to the children's compliance with perceptible affordances (Shaw 2017), consequently leaving out emic perspectives on meaning making outside this scope. Drawing on Vygotsky's sociocultural theory, Jo Bird and Susan Edwards (2015) and Rita Brito (2016) qualitatively study how young children, ages four to six, learn to use digital media and technologies. Bird and Edwards propose a "digital play framework" showing that young children's play with technology, including tablet computers, in a school environment moves from epistemic to ludic. Brito finds that curious children experiment with functionalities—a finding that is in line with Shaw's nuanced perspective on affordances and stresses the importance of parents and siblings as social role models for young children. However, she suggests that, as children grow more proficient in their use of digital technologies, they start to play with and operate touch screens more independently.

The relationship between the social and the individual in young children's tablet computer play practices is particularly interesting, since alarmist discourses tend to focus on images of children isolating themselves when playing with tablet computers. As we have seen, young children look to their immediate environment, namely parents and siblings, for guidance when in doubt about functionalities of tablet computers. Furthermore, as described by Nicola Yelland (2016) among others, young children (four-year-olds) are able to communicate and play together using creative apps. This suggests young children scaffold information about tablet computers from peers and adults and negotiate, share, and draw on this knowledge when playing with others.

Learning from Playing with Tablet Computers

As Fleer (2014) found, young children subscribe to play as a leading activity with which they align their motives for action. However, in describing an age group ranging from zero to eight years, she held that young children present vastly different subscriptions to play and formal learning, generally moving from the former toward the latter as they grow older. The general move from play as a dominant leading activity toward formal learning is also associated with the institutional settings children navigate. Within these environments, parents and other adults often expect children to progress, develop, and learn, in different senses of the word. In tablet computer research with young children, this translates to an interest in exploring the learning outcomes we may expect from children's interactions with these devices. Importantly, however, learning is not in direct opposition to play but helps us instead filter important aspects of play culture, as we shall see.

Susanne Garvis (2016), Noorhidawati, Ghalebandi, and Hajar (2015), Petra Petersen (2015), and Yelland (2016) have all conducted studies about young children's learning through the use of tablet computers in institutional settings. Relying on psychological theories about psychomotor, affect, and cognition, Noorhidawati, Ghalebandi, and Hajar demonstrate empirically how these three major "learning notions" support learning in the play of children ages four to six with apps on tablet computers. In Garvis's study, teachers reported that tablet computers had motivated and engaged the children both emotionally and cognitively. She also reports that agency in handling the devices expanded among teachers and children as the experiment progressed. Her findings resulted from

an experiment in which tablet computers were used for digital narration via the applications *DoodleCast* and *PuppetPals* with children between the ages of 3.5 and 4.5 years old.

The studies by Petersen and Yelland both comment on the affordances of the tablets and apps. They stress how app design should aim for balanced simplicity and open-ended structure, thus encouraging creative use, which in turn develops a variety of skills and allows children to focus more on what they want to do and less on how they do it. These points are very much in line with the report by Marsh and her colleagues (2015) in which similar design advice is articulated. Moreover, this underscores how the appeal of digital toys, and thus their affordances, depends on the knowledge children already have about these kinds of objects, as well as the emotional aspects of the affective dimensions of play and creativity.

Research often points to the important sociocultural aspects of play and learning. Children's proficiency in playing with tablet computers depends on parents and other adults as well as on siblings and peers, and it progresses statistically with age. When children work out how to operate tablet computers, their play becomes more creative and empowering as well as ludic. This research underscores the sociocultural value that fosters and develops play practices and how learning takes place when needed for play. The research does not, however, reveal much about how particular play practices are important to children and how they lead to receptive use of tablet computers and to new skills.

Perspectives of Transgressive Play and Creativity

In comparison to the dominant body of research framed by learning perspectives, the findings presented here rely instead on play and creativity theories—while also adhering to the principles of new child sociology (Christensen and James 2008; Corsaro 1997; James and Prout 1997) as well as sociocultural theory (e.g. Vygotsky 1978). The findings point toward a transgressive or frivolous aspect of play (Sutton-Smith 1997) that does not garner much attention in research framed by learning perspectives. It is the kind of play that can be hard to understand, because it can seem silly or divorced from the objectives intrinsic to dominant affordances (Shaw 2017), but it points to children's creativity in play with tablets and how this empowering disposition is seldom reflected in designs.

In the study by Marsh and her colleagues (Marsh 2016; Marsh et.al. 2015),

a new framework for digital play was introduced, partly in response to Bird and Edwards (2015) and their digital play framework, which the former considered too slanted toward learning to embrace the multifaceted aspects of play. The new framework they constructed came from video observations of twelve children three to five years old in an institutional setting. Their findings point to the change digital play makes in the nature of play in the sense that it "moves across physical and virtual domains and integrates material and immaterial practices" (2). Their study also rejected any dichotomy between traditional and digital play, because these concepts are socially and culturally intertwined. Marsh (2016) argues that a category of transgressive play needs to be added to Hughes's (2002) framework because children often go outside the intentions of the design when playing.

Stine Liv Johansen's (2014) research in a Danish after-school club also documents how young children, in this case, ages six to nine, play with each other using tablet computers as mediums and tools. She describes how the kinds of play the children undertake are sometimes frivolous as well as serious in the sense that their play is most often very meaningful to them. Johansen has observed children form large play groups around some apps and reports that children often trade devices when playing games such as *The Sims* or *Minecraft* if they need to take advantage of someone else's skills or knowledge.

Tablet computers afford creative options for children. Arnott, Grogan, and Duncan (2016) researched whether iPads help young children's express their creativity. They suggest that "iPads offer a mechanism to allow young children to articulate their creative play" (157). They also find that the children creativity was very well supported by tablet computers when the software afforded their intentions. However, they identified a critical lack in the available software. The researchers recommended that future applications should allow children to engage in multimodal creative expression with customizable functionalities. This is also a well-known critique in the field of game studies where, as Sara Grimes (2015) argues, the child player is often configured as easily amused even though many studies indicate that limited functionality is frustrating to children.

These findings underscore the need to move beyond drill-and-practice oriented designs in apps to afford autotelic play and creativity. This demand was specifically mentioned in the studies conducted by Arnott, Grogan, and Duncan (2016) and by Grimes (2015), but the motives of young children for engaging in transgressive play also point to it. Moreover, adults must show an interest in children's play and acknowledge the importance felt toward it to foster the

relationship within which they, later on, may expect to be part of their children's digital lives. Tablet computers are social artifacts in the lives of young children, and the experience garnered from everyday practices that occur in play may well be incorporated into future design. However, because apps for young children constitute a profitable business, production companies cater to expectations of children as well as the parents—who control the credit cards.

The Parental Perspective

Given the significant role of parents in the lives of their children, the opinions and observations of parents about their children regarding tablet computers have been the subject of considerable research. The findings from these studies may inform discussions on affordances of tablet computers for young children because parents act as gatekeepers of access and guidance. Four studies (Broekman et al. 2016; Holloway, Green, and Love 2014; Lauricella, Wartella, and Rideout 2015; and Nevski and Silbak 2016) here have focused on what parents make of their children's interactions with apps and screens.

Two of these studies—Holloway, Green, and Love and Nevski and Andra—take a qualitative and holistic approach from the parental perspective, making observations and conducting interviews in the homes of families with young children. The first presents results pertaining to the parental roles of mediation in "digital lives" of preschoolers. Using empirical examples, it studies how parents and their children collaborate and interact around apps and devices and concludes that this focus on app-related practices is much needed in research to avoid shallow discussions about screen time. Holloway, Green, and Love write that "recognition of the benefits perceived by families, and the whole-hearted enjoyment and engagement that characterise much infant and preschooler app use, should be central to the forthcoming research agenda" (154). Nevski and Silbak draw on an ethnography of one UK family with two young children and report on a mother who had a restrictive attitude towards screens and a father who was keen to be involved rather than restrict. Both studies reveal the complex media practices that take place in a family with young children and how parents in the same family do not always represent the same strategies and attitudes toward their children and tablet computers.

The studies by Francette Broekman and her colleagues (2016) and Lauricella, Wartella, and Rideout (2015) both conducted quantitative research using

surveys in which they asked parents of young children about their attitudes and to report on their children's practices. Drawing on theories of uses and gratifications, Broekman and her colleagues articulated two kinds of parents around these strategies—permissive parents who look for apps that occupy their children and authoritative parents who focus on so-called tailored and educational apps. They find support of this strategy in a study conducted by Christine Feil (2016) among German children ages two to six and their parents at home. Lauricella, Wartella, and Rideout (2015) concluded from their survey of 2,326 parents of young children that children mirror their parents' attitudes towards screens. They also concluded that children between the ages of six and eight care less about their parents' opinions. These findings are, however, based on parents' report and thus limited as such.

These findings tell us that in young children's play with tablet computers, parents serve as the children's gatekeepers and see different opportunities in these devices. These parents are not only gatekeepers in the sense of allowing children to use tablet computers but also in the sense of providing them with agency in their use. The findings from within the parental perspective, along with our understanding of digital literacy and the recurrent sociocultural aspects of tablet computer play, point to variances in parenting styles that are likely to affect children's individual agency in play.

What We Need to Explore

Young children's tablet computer play takes place in different contexts, and parents, teachers, siblings, and peers play crucial parts in the formation of digital literacy as well as the cultivation of digital play. In an assessment of studies on technology and literacy in the early years, Cathy Burnett and Karen Daniels (2016) have identified a need for open-ended exploratory research. They argue that the familiar situation involving children, parents and tablet computers can be viewed as "trialogical" and that we need to explore notions of meaning making within this configuration. They also argue that play should be considered more often in research as an autotelic concept, thus viewing meaning making as situated in play culture.

Marsh (2016) called one important aspect of autotelic play with tablet computers "transgressive play." This kind of play was not found in research about learning and serves as a great example of how emic perspectives in young

children's play culture involving tablet computers requires further examination. Transgressive play is a well-known phenomenon in play theory, championed as frivolous play by Sutton-Smith (1997) and silly play by Mouritsen (1996) and Karoff (2013). It is the kind of play that expands our understanding of affordances in relation to Jenkins's (2009) definition of play in digital literacy—experimenting with one's environment to solve problems. The problem, however, pertains to the intrinsically meaningful or autotelic in play, and thus we are not able to research it unless we approach it from an explorative angle.

From this kind of exploratory research, we stand to gain some valuable insights into digital play practices that may help us understand the culture of play of young children. These insights may be used in app design as well as provide inspiration to include young children in design processes. Young children focus on technologies' affordances for play and seek to expand them vis-à-vis transgressive play. As researchers, we should acknowledge this important cultural aspect. Furthermore, we need to expand the research in this field beyond the global North to include international perspectives on this type of play culture.

Conclusion

This review has shown that research about young children and their use of tablet computers most often deals with perspectives regarding digital literacy, learning, and parental mediation. These studies underscore how young children's tablet computer play is integrated in socially dense contexts. The studies also reveal that young children stand to learn a lot from playing with tablet computers and that playful behavior leads to proficiency in handling tablet computers autonomously, especially when adults, through interest and guidance, support these activities. Parents' attitudes toward young children's tablet computer play reflect the digital literacy and learning perspectives to some degree, as technological proficiency and formal learning are among key parental motives for selecting apps. These mediation strategies and parenting styles affect the affordances of tablet computers for young children's play.

Important research within this field has been conducted with play and creativity theories at the forefront. The studies presented here have underscored the importance of adults understanding young children's digital play culture and how it is very meaningful and real to them in a cultural and social sense. Tablet computer play is emblematic of a new era in young children's play culture, as

described by the important study conducted by Jackie Marsh and her associates (2015), which introduced a new classification for digital play. The findings from this study have underscored how we need to explore young children's practices of digital play by also looking to transgressive aspects. From this kind of research, we stand to learn much about young children's digital play culture as well as affordances and qualities of design. The questions we propose should be mindful of the autotelic qualities of play and thus not perpetually seek to functionalize it toward formal learning.

References

Arnott, Lorna, Deirdre Grogan, and Pauline Duncan. 2016. "Lessons from Using iPads to Understand Young Children's Creativity." *Contemporary Issues in Early Childhood* 17:157–73. doi:10.1177/1463949116633347.

Aziz, Nor Azah Abdul, Nur Syuhada Mat Sin, Firat Batmaz, Roger Stone, and Paul Wai Hing Chung. 2014. "Selection of Touch Gestures for Children's Applications: Repeated Experiment to Increase Reliability." *International Journal of Advanced Computer Science and Applications* 5:97–102. doi:10.14569/IJACSA.2014.050415.

Bird, Jo, and Susan Edwards. 2015. "Children Learning to Use Technologies through Play: A Digital Play Framework." *British Journal of Educational Technology* 46:1149–60. doi:10.1111/bjet.12191.

Brito, Rita. 2016. "'Who Taught You How to Play?' 'I Did!': Digital Practices and Skills of Children under 6." *Media Education: Studi, ricerche, buone pratiche* 7:281–302. doi:10.14605/MED721607.

Broekman, Francette L., Jessica T. Piotrowski, Hans W. J. Beentjes, and Patti M. Valkenburg. 2016. "A Parental Perspective on Apps for Young Children." *Computers in Human Behavior* 63:142–51. doi:10.1016/j.chb.2016.05.017.

Buckingham, David. 2015. "Defining Digital Literacy: What Do Young People Need to Know about Digital Media?" *Nordic Journal of Digital Literacy* 4:21–35.

Burnett, Cathy, and Karen Daniels. 2016. "Technology and Literacy in the Early Years: Framing Young Children's Meaning Making with New Technologies." In *Understanding Digital Technologies and Young Children: An International Perspective*, edited by Susanne Garvis and Narelle Lemon, 18–27.

Chaudron, Stephane. 2015. *Young Children (0–8) and Digital Technology: A Qualitative Exploratory Study across Seven Countries*. http://publications.jrc.ec.europa.eu/repository/handle/JRC93239.

Christensen, Pia Monrad, and Allision James. 2008. *Research with Children: Perspectives and Practices*. 2nd ed.

Corsaro, William A. 1997. *The Sociology of Childhood*.

Creswell, John W. 2014. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 4th ed.

Dewey, John. 1971. *The Child and the Curriculum and the School and Society*.

Drotner, Kirsten, and Ola Erstad. 2014. "Inclusive Media Literacies: Interlacing Media Studies and Education Studies." *International Journal of Learning and Media* 4:19–34.

Feil, Christine. 2016. "Tablets im Familienalltag von Klein- und Vorschulkindern." *Studies in Communication Sciences* 16:43–51. doi:https://doi.org/10.1016/j.scoms.2016.04.006.

Fleer, Marilyn. 2014. "The Demands and Motives Afforded through Digital Play in Early Childhood Activity Settings." *Learning, Culture, and Social Interaction* 3:202–9. doi:10.1016/j.lcsi.2014.02.012.

Fróes, Isabel. 2015. "Once Upon a Tablet: A School Toy in the Making." Paper presented at the Universal Access in Human-Computer Interaction. Los Angeles, CA, August 2–7, 2015.

Garvis, Susanne. 2016. *Understanding Digital Technologies and Young Children: An International Perspective*.

Gibson, James Jerome. 1986. *The Ecological Approach to Visual Perception*.

Grimes, Sara M. 2015. "Configuring the Child Player." *Science, Technology, & Human Values* 40:126–48. doi:10.1177/0162243914550253.

Hall, Stuart. 2007. "Encoding, Decoding." In *The Cultural Studies Reader*, 3rd ed., edited by Simon During, 477–87.

Havemann, Tom, and Maria Øksnes. 2012. *Legens flertydighed : børns leg i en institutionaliseret barndom*.

Hedegaard, Mariane. 2002. *Learning and Child Development: A Cultural-Historical Study*..

Holloway, Donell, Lelia Green, and Sonia Livingstone. 2013. *Zero to Eight: Young Children and Their Internet Use*.

Holloway, Donell, Lelia Green, and Carlie Love. 2014. "'It's All about the Apps': Parental Mediation of Pre-Schoolers' Digital Lives." *Media International Australia* 153:148–56.

Hughes, Bob. 2002. *A Playworker's Taxonomy of Play Types*, 2nd ed.

James, Allison, and Alan Prout, eds. 1997. *Constructing and Reconstructing Childhood: Contemporary Issues in the Sociological Study of Childhood*. 2nd ed.

Jenkins, Henry. 2009. *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*.

Johansen, Stine Liv. 2014. *Børns liv og leg med medier*.

Johansen, Stine Liv, Malene Charlotte Larsen, and Marie Junge Ernst. 2016. *Young Children (0–8) and Digital Technology: A Qualitative Exploratory Study - National Report - DENMARK*.

Karoff, Helle Skovbjerg. 2013. "Play Practices and Play Moods." *International Journal of Play* 2:76–86. doi:10.1080/21594937.2013.805650.

Lampert, Claudia. 2016. "Crawling, Walking, Swiping: German Preschool Children's

Mobile Touchscreen Use." *Media Education: Studi, ricerche, buone pratiche* 7:341–57.

Lauricella, Alexis R., Ellen Ann Wartella, and Victoria J. Rideout. 2015. "Young Children's Screen Time: The Complex Role of Parent and Child Factors." *Journal of Applied Developmental Psychology* 36:11–17. doi:10.1016/j.appdev.2014.12.001.

Livingstone, Sonja M. 2002. *Young People and New Media: Childhood and the Changing Media Environment*. 1st ed.

Marsh, Jackie. 2016. "The Digital Literacy Skills and Competences of Children of Pre-School Age." *Media Education: Studi, ricerche, buone pratiche* 7:197–214.

Marsh, Jackie, Lydia Plowman, Dylan Yamada-Rice, Julia Bishop, Jamal Lahmar, Fiona Scott, Andrew Davenport, Simon Davis, Katie French, Maddalena Piras, Sally Thornhill, Peter Robinson, and Peter Winter. 2015. *Exploring Play and Creativity in Pre-Schoolers' Use of Apps: Final Project Report*. http://www.techandplay.org/reports/TAP_Final_Report.pdf.

Marsh, Jackie, Lydia Plowman, Dylan Yamada-Rice, Julia Bishop, and Fiona Scott. 2016. "Digital Play: A New Classification." *Early Years* 36:242–53. doi:10.1080/09575146.2016.1167675.

Martin, Allan. 2008. "Digital Literacy and the 'Digital Society.'" In *Digital Literacies: Concepts, Policies, and Practices*, edited by Colin Lankshear and Michele Knobel, 151–76.

Mouritsen, Flemming. 1996. *Legekultur: essays om børnekultur, leg og fortælling*.

Nacher, Vicente, Javier Jaen, Elena Navarro, Alejandro Catala, and Pascual González. 2015. "Multi-Touch Gestures for Pre-Kindergarten Children." *International Journal of Human-Computer Studies* 73:37–51. doi:10.1016/j.ijhcs.2014.08.004.

Neumann, Michelle M. 2014. "An Examination of Touch Screen Tablets and Emergent Literacy in Australian Pre-School Children." *Australian Journal of Education* 58:109–22. doi:10.1177/0004944114523368.

Nevski, Elyna, and Andra Silbak. 2016. "Mediation Practices of Parents and Older Siblings in Guiding Toddlers' Touchscreen Technology Use: An Ethnographic Case Study." *Media Education: Studi, ricerche, buone pratiche* 7:320–40.

Noorhidawati, A., Ghazal Ghalebandi, and Hajar Roffeei. 2015. "How Do Young Children Engage with Mobile Apps? Cognitive, Psychomotor, and Affective Perspective." *Computers & Education* 87:385–95. doi:10.1016/j.compedu.2015.07.005.

Norman, Donald A. 1988. *The Psychology of Everyday Things*.

Petersen, Petra. 2015. "'That's How Much I Can Do!': Children's Agency in Digital Tablet Activities in a Swedish Preschool Environment." *Nordic Journal of Digital Literacy* 10:145–69.

Shaw, Adrienne. 2017. "Encoding and Decoding Affordances: Stuart Hall and Interactive Media Technologies." *Media, Culture & Society* 39:592–602. doi:10.1177/0163443717692741.

Sicart, Miguel. 2014. *Play Matters*.

Spariosu, Mihai I. 1989. *Dionysus Reborn: Play and the Aestetic Dimension in Modern Philosophical and Scientific Discourse*.

Stephen, Christine, and Lydia Plowman. 2014. "Digital Play." In *The SAGE Handbook of Play and Learning in Early Childhood*, edited by Liz Brooker, Mindy Blaise, and Susan Edwards, 330–41.

Sutton-Smith, Brian. 1997. *The Ambiguity of Play*.

Teichert, Laura, and Ann Anderson. 2014. "'I Don't Even Know What Blogging Is': The Role of Digital Media in a Five-Year-Old Girl's Life." *Early Child Development and Care* 184:1677–91. doi:10.1080/03004430.2013.875540.

Vatavu, Radu-Daniel, Gabriel Cramariuc, and Doina Maria Schipor. 2015. "Touch Interaction for Children Aged 3 to 6 Years: Experimental Findings and Relationship to Motor Skills." *International Journal of Human-Computer Studies* 74:54–76. doi:10.1016/j.ijhcs.2014.10.007.

Vygotsky, Lev Semenovich. 1978. *Mind in Society: The Development of Higher Psychological Processes.* Edited by Michael Cole, Vera John-Steiner, Sylvia Scribner, and Ellen Souberman.

Wohlwend, Karen E. 2015. "One Screen, Many Fingers: Young Children's Collaborative Literacy Play with Digital Puppetry Apps and Touchscreen Technologies." *Theory Into Practice* 54:154–62. doi:10.1080/00405841.2015.1010837.

Yelland, Nicola. 2016. "iPlay, iLearn, iGrow: Tablet Technologies, Curriculum, Pedagogies, and Learning in the Twenty-First Century." In *Understanding Digital Technologies and Young Children: An International Perspective*, edited by Susanne Garvis and Narelle Lemon, 122–38.